Table 9-1.—Permissible velocities for diversions.

Soil texture	Bare channel	Retardance*	Permissible velocity: Channel Poor	Vegetation Fair	Condition—Good
	m/s (ft/s)		m/s (ft/s)		
Sand, silt, sandy loam, and silty loam	0.45 (1.5)	B	0.61 (2.0)	0.91 (3.0)	1.22 (4.0)
		C	0.45 (1.5)	0.76 (2.5)	1.07 (3.5)
		D	0.45 (1.5)	0.61 (2.0)	0.91 (3.0)
Silty clay loam and sandy clay loam	0.61 (2.0)	B	0.91 (3.0)	1.22 (4.0)	1.52 (5.0)
		C	0.76 (2.5)	1.07 (3.5)	1.37 (5.0)
		D	0.61 (2.0)	0.91 (3.0)	1.22 (4.0)
Clay	0.76 (2.5)	B	1.07 (3.5)	1.52 (5.0)	1.83 (6.0)
		C	0.91 (3.0)	1.37 (4.5)	1.68 (5.5)
		D	0.76 (2.5)	1.22 (4.0)	1.52 (5.0)
Coarse gravel	1.52 (5.0)	B, C, or D	1.52 (5.0)	1.83 (6.0)	2.13 (7.0)
Cobbles and shale	1.83 (6.0)	B, C, or D	1.83 (6.0)	2.13 (7.0)	2.44 (8.0)

*The choice of retardance B, C, or D will depend on the vegetation and maintenance planned for the diversion channel. Refer to the Handbook for Channel Design, SCS-TP-61, or similar information in the field office technical guide, to select the vegetal retardance.

Stability to be checked for minimum anticipated retardance (bare earth if applicable). Refer to Exhibits 7-1 and 7-2 (pages 7-17, 18, 19) of SCS-TP-61 for more informations

Velocities

Diversions should be planned and designed to fit the conditions of a particular site. The velocities should be kept as high as will be safe for the planned type of cover and the expected maintenance. Where permissible design velocities are not established in local standards and specifications, table 9-1 may be used as a guide in selecting design velocities, except in arid areas. Based on local experience, problem soils may require other limiting velocities. The permissible velocity should be selected on the basis of the soil horizon into which the channel is excavated and the planned vegetative treatment. The permissible velocity as described for vegetative linings is based on the vegetation having been established.

The choice of retardance C or D will depend on the vegetation and maintenance planned for the diversion channel. D retardance is for a good stand maintained at a 50- to 150-mm (2- to 6-in) height. C retardance is for channels with enough vegetation to cause a considerable resistance to the flow. The Handbook for Channel Design, SCS-TP-61, or similar information in the field office technical guide should be used in selecting the vegetal retardance.

Channel Cross Section

A typical diversion cross section consists of a channel and a supporting ridge. The channel may be parabolic, trapezoidal, or V shaped (fig. 9-8). Several factors are considered when selecting the type of channel cross section.

On steep slopes, narrow and deep channels may be required to reduce earth moving. Broad, shallow channels on gentle slopes are usually more desirable. If placed through woodland, narrow channels would be less damaging to vegetation.

The type of land use will also affect channel shape. In agricultural areas the channel dimensions should be adapted to farming equipment. Diversions which are easy to cross with equipment will be easier to maintain. Steep back diversions are not designed to be crossed by equipment and should be maintained in grass or woody vegetation. Diversions associated with residential developments or recreation areas should be designed to be safe and unintrusive.

The type of equipment available for construction should also be considered. For example, a tractor with a blade or bulldozer is often used to shape a parabolic channel and motor patrol graders on V-type channels.

EFM NITICE PA-9, 4/18/87